DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

MTH6 Review Sheet III

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1. Simplify:

    (a) $\sqrt{108}$
    (b) $\sqrt{180}$
    (c) $\sqrt[3]{40}$
    (d) $\sqrt[3]{-64}$

2. Perform the indicated operations and simplify (all variables represent positive real numbers):

    (a) $5\sqrt{12} - 4\sqrt{3} + \sqrt{75}$
    (b) $\left(2\sqrt{3}\right)\left(3\sqrt{5}\right)$
    (c) $(4 + \sqrt{2})(5 - 3\sqrt{2})$

    (d) $(8 + 2\sqrt{3})^2$
    (e) $(1 - 2\sqrt{11})(1 + 2\sqrt{11})$
    (f) $\sqrt{\dfrac{7}{18}}$

    (g) $\dfrac{\sqrt{2}}{\sqrt{5}}$
    (h) $\dfrac{\sqrt{3}}{\sqrt{x}}$
    (i) $\dfrac{\sqrt[3]{2x}}{\sqrt[3]{9x^2}}$

    (j) $\dfrac{1}{2 + \sqrt{3}}$
    (k) $\dfrac{\sqrt{x} - \sqrt{y}}{\sqrt{x} + \sqrt{y}}$

3. Perform the indicated operations and simplify (all variables represent positive real numbers):

    (a) $64^{-2/3}$
    (b) $\left(\dfrac{9}{16}\right)^{-1/2}$
    (c) $\left(64x^3 y \cdot xy^5\right)^{4/3}$

    (d) $\left(\dfrac{27x^5 y}{8y^3}\right)^{1/3}$
    (e) $\left(\dfrac{8x^{\frac{1}{4}} y^{-\frac{3}{4}}}{x^{-\frac{1}{2}} y^3}\right)^{2/3}$

4. Perform the indicated operations with complex numbers.

    (a) i^{34}
    (b) i^{51}
    (c) $(3 + 5i) + (4 - 7i)$

    (d) $(-7 + 8i) - (10 - 2i)$
    (e) $(2 + 3i)(-5 + i)$
    (f) $(3 - 5i)(-2 - 4i)$

    (g) $i(4 + 5i)$
    (h) $\dfrac{3 + i}{2 - 5i}$
    (i) $\dfrac{5 - i}{5 + i}$

4. Solve the equation.

(a) $\sqrt{2x+3} - 3 = 0$ 　　　　(b) $\sqrt{2x+5} = 3\sqrt{x-1}$ 　　　　(c) $\sqrt{3x+4} - x = 2$

6. Solve the equation **by quadratic formula**.

(a) $x^2 - 2x - 6 = 0$ 　　　　(b) $x^2 - 3x = 0$ 　　　　(c) $x^2 = 8$

7. Solve the equation **by any method**.

(a) $2x^2 + 18 = 0$ 　　　　(b) $x^2 + 4x + 20 = 0$ 　　　　(c) $4x^2 + 5x - 6 = 0$

(d) $(2x - 3)(x + 4) = 4$ 　　　　(e) $x^4 - 7x^2 + 12 = 0$